Why are there so many injuries? Why aren't we stopping them?

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Age-adjusted mortality rates for death due to injuries have decreased in Canada in recent years,[1] but that is no reason for complacency.

Injuries are still the leading killer of our preschool and school-age children, adolescents and young adults. For Canadians aged 1 to 24, intentional and unintentional injury accounts for 63% of all deaths,[1] and injury mortality rates for Canadian children aged 5 to 14 exceed those of Japan, Australia and most countries in Western Europe.[2] As well, there are large variations in provincial injury mortality rates[3] and rates are much higher for natives than for non-natives.[4]

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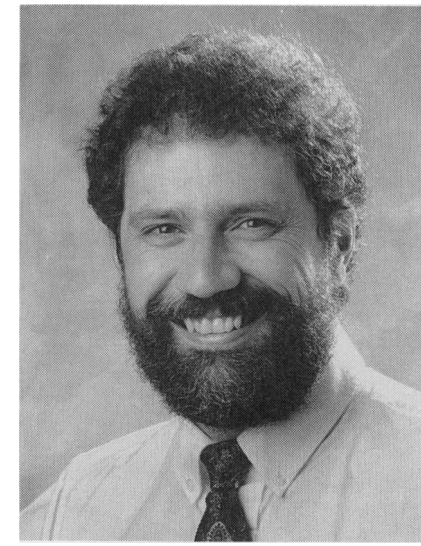
— Dr. Louis Francescutti



These injury-related deaths are but the tip of the iceberg. For every fatal childhood injury, another 45 injuries will require hospital treatment and about 1300 more will require a visit to an emergency department; an unknown number will result in a visit to a physician or clinic.[5] The impact of these injuries is felt far beyond the injured person; family members, employers, health care systems and the community are affected.

Too many Canadians and too many physicians regard these injuries as accidents — random, unpredictable events. Today this "last folklore subscribed to by rational men"[6] is being replaced by the modern view that injuries are both predictable and preventable. Gordon[7] recognized that, like infectious diseases, injuries are caused by the interaction of the host, the agent and the environment. Gibson[8] determined that they are caused by the exchange of

energy — mechanical, thermal, radiant, chemical or electrical — that is beyond the capacity of the human organism. Haddon[9] subsequently modified this energy-transfer analysis to include "negative agents" for injuries produced by the absence of such necessary elements as oxygen or heat. Haddon[10] also extended Gordon's analysis by developing a phase-factor matrix.

In this matrix the host, energy vector and environment are seen as factors that interact over time to cause injury. This matrix can be used for all types of injuries.

In the case of motor vehicle collisions, the preinjury phase includes factors that will determine if a collision takes place — the driver's alertness, for instance, or the condition of a car's brakes and the road surface. The injury phase comprises factors that determine whether an injury occurs once a collision takes place. These include the age of the injured person and the use or nonuse of seat belts and the presence of roadside barriers. Finally, the postinjury phase involves factors that determine the consequences of the injury that has been sustained and whether a secondary injury will occur because of factors such as the physical condition of the injured person, fuel leaks from the damaged vehicle, or the time lapse before definitive care is provided. Haddon's matrix provides a powerful tool for examining the causes of all types of injuries and for generating ways to prevent and control them.

Numerous strategies for markedly reducing the injury mortality and morbidity rates have been shown to be effective. These include the use of seat restraints,[11,12] child-proof medicine containers,[13] bars on upper-story windows,[14] and wearing helmets while riding motorcycles.[15] If we have these strategies, why do injuries continue to take such a great toll, especially among younger people? If an infectious disease was responsible for this many deaths, there would be an outcry.

Most decision-makers and most Canadians do not know how large the injury problem is or the things we could do to solve it. One reason is the way injuries are usually reported in the media — as isolated events. When they are linked together as one "disease," the size of the problem and the need for more action becomes clear. Furthermore, we haven't had more action because there has been insufficient leadership in the field. This has caused both duplication and a lack of coordination among government agencies and other organizations.

The marketing of injury pre-

Edmonton Sun

"We are inundated with commercials for cars that reach 100 kmph in a few seconds, certainly a practical feature for city driving."

This 11-year-old boy, who fell from his bike and sustained a skull fracture and subdural hematoma, was hospitalized for 7 days. For every fatal childhood injury, another 45 patients will be admitted to hospital.

vention is also part of the problem — many prevention campaigns are unimaginative when the subject cries out for imagination. We are drowning in pamphlets when we should be trying music videos; we have dry speeches where we should have hard-hitting commercials. We have not had them because there has been insufficient funding for injury-prevention projects and research.

If information about injury prevention has not been getting through, the message that risk-taking is a good thing certainly has. We are inundated with commercials for cars that reach 100 kmph in a few seconds, certainly a practical feature for city driving. We couple this glorification of speed with commercials for alcohol, and it makes for a lethal combination. By age 17 the typical Canadian teenager will have seen several thousand beer commercials, advertisements that sell a lifestyle, not beer, and are telling them that happiness and popularity are found only behind a brown bottle. As well, some widely used interventions, such as education programs for impaired drivers[16] and teenagers,[17] are of questionable value.

Anyone involved in injury prevention will meet several roadblocks. One is the misconception that injuries are "just an accident, a part of modern life." Another is the conflict between public and individual rights that arises after some interventions, such as seat-belt legislation or roadside breath testing.

Finally, there is the focus we give this issue. So far it has been on treatment, not prevention, and treatment of injuries is simply proof of our failure to prevent them. For many injuries, such as those involving spinal cord or brain damage, there are no effective treatments. Our inability to prevent them means we need more trauma centres, more intensive care units, more rehabilitation services. Prevention of injuries should mean that we need fewer of these services, but existing trauma systems will have to be of the highest quality to diminish the secondary injury and to decrease morbidity.

Because of the complexity and pervasiveness of injuries, a systematic approach to their reduction is needed. It should include:

- An increase in Canadians' awareness of the importance of injuries and the potential for reducing them.
- The development of injury surveillance systems at national and local levels to monitor the extent, nature and causes of injuries.
- The launch of a coordinated, three-pronged prevention effort to raise awareness and change behaviour, make environmental modifications and introduce policy and legislative changes. (The effectiveness of all new programs should be evaluated.) Existing laws such as seat-belt legislation need better enforcement, and new legislation, such as a law lowering the legal alcohol level for drivers to 0.05 mg/L from the existing 0.08 mg/L, should be introduced. As well, since the likelihood of success is greater if the responsibility for prevention does not lie with individuals, as many passive prevention measures as possible should be instituted. For instance, speed limits should be lowered, particularly on two-lane highways. Air-bag and passive seat-belt technology should become standard in motor vehicles. Such measures have a higher rate of use and do not need a message to get through before they are acted on. Finally, interventions need to be aimed at specific target groups. The message that works for a teenager might not work for a senior citizen.

Canada also needs more research into the circumstances that lead to injuries, and the evaluation of injury prevention interventions, and its doctors must become more active in the field.

No single agency can effectively deal with the injury problem. At the national, provincial and local level, coalitions of government agencies, professional associations, nonprofit organizations, and industry and community members need to work together. For this to occur there must be leadership and consensus on what needs to be done. The United States has been a leader in both areas. Since 1985 the Centers for Disease Control in Atlanta has

been administering a national injury control program — reducing injuries is part of the country's health objectives for the year 2000.

Canada might do well to learn some lessons from the US. The Trauma Association of Canada has called for the formation of a National Advisory Committee on Injury in Canada, which would provide leadership in this field. There are numerous options for coordinating activities. For instance, commissions with authority over ministries such as health, transportation and agriculture could be established. A national centre, as well as provincial and territorial ones, could be funded. The process of setting year 2000 injury control objectives for Canada was recently launched. Several groups, from government health departments to professional associations and nonprofit organizations, are involved in formulating them. It is hoped that a May 1991 symposium in Edmonton will result in a set of measurable objectives for injury control that can be forwarded to government agencies for adoption.

As the National Academy of Sciences reported in 1985: "Injury is probably the most under-recognized major public health problem facing the nation today, and the study of injury represents unparalleled opportunities for reducing morbidity and mortality and for realizing significant savings in both financial and human terms — all in return for a relatively modest investment."

The time is right to make a major advance in injury prevention and control in Canada. There is an increased awareness within government and nongovernmental agencies about the extent of injuries and the potential for reduction. Advocacy groups are committed to preventing them. Effective interventions to reduce the number of many kinds of injuries are known.

We must seize the moment.

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Injuries take heavy toll

During the course of a year, about one in five Canadians will be involved in an "accident," Statistics Canada says (Millar W, Adams O: Accidents. *Can Soc Trends* 1990; summer: 22-24).

The federal agency says 3.8 million Canadians aged 15 and over had 5.1 million of them in 1987, accounting for 19% of the adult population. (An "accident" is an event that restricts normal activity for at least half a day or resulted in personal expenses of $200 or more.)

"At most ages, men were more likely than women to have an accident," says Statistics Canada. "Young men were especially accident-prone. In 1987, 41% of men aged 15-24 had [one], while the proportion for women that age was 25%."

Motor vehicle collisions, which accounted for 33% of the total, were the most common type of mishap in 1987, while 23% were sports-related and 21% work-related. Injuries at home accounted for 13%, and 10% could not be classified.

According to Statistics Canada, Canadians experienced more than 51 million days of restricted activity in 1987 because of these incidents.